

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Michael A. Robinson et al.

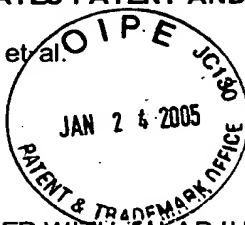
Serial No.: 09/818,433

Filing Date: March 26, 2001

Title: FIBER OPTIC RECEIVER WITH AN ADJUSTABLE BANDWIDTH POST-AMPLIFIER

Examiner: Payne, David C

Group Art Unit: 2633



COMMISSIONER FOR PATENTS
PO Box 1450
Alexandria, VA 22313-1450

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TRANSMITTAL LETTER FOR RESPONSE/AMENDMENT

Sir:

Transmitted herewith is/are the following in the above-identified application:

- (X) Response/Amendment () Petition to extend time to respond
() New fee as calculated below () Supplemental Declaration
(X) No additional fee (Address envelope to "Mail stop Non-Fee Amendments")
() Other: _____ (fee \$ _____)

CLAIMS AS AMENDED BY OTHER THAN A SMALL ENTITY						
(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT	(3) NUMBER EXTRA	(4) HIGHEST NUMBER PREVIOUSLY PAID FOR	(5) PRESENT EXTRA	(6) RATE	(7) ADDITIONAL FEES
TOTAL CLAIMS		MINUS		= 0	X \$18	\$ 0
INDEP. CLAIMS		MINUS		= 0	X \$88	\$ 0
{ } FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM					+ \$300	\$ 0
EXTENSION FEE	1ST MONTH \$110.00	2ND MONTH \$430.00	3RD MONTH \$980.00	4TH MONTH \$1530.00		\$ 0
OTHER FEES						\$
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT						\$ 0

Charge \$ 0 to Deposit Account 50-1078. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 50-1078 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 50-1078 under 37 CFR 1.16, 1.17, 1.19, 1.20 and 1.21. A duplicate copy of this sheet is enclosed.

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Date of Deposit: Jan. 18, 2005

Typed Name: Edouard Garcia

Signature: [Signature]

Respectfully submitted,

Michael A. Robinson et al.

By [Signature]

Edouard Garcia

Attorney/Agent for Applicant(s)

Reg. No. 38,461

Date: Jan. 18, 2005



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Applicant : Michael A. Robinson et al. Art Unit : 2633
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RESPONSE TO THE EXAMINER'S ACTION DATED OCTOBER 20, 2004

I. Status of claims

Claims 1-15 were pending.

Claims 2-12, 14, and 15 have been allowed.

II. Claim rejections under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1 and 13 under 35 U.S.C. § 103(a) over Yonemura (U.S. 6,540,412) in view of Ohhata (US 6,304,357) and Williams (US 5,864,416).

A. Independent claim 1

Regarding claim 1, the Examiner has asserted that Yonemura discloses a fiber optic receiver that includes: a substrate; a ROSA mounted on the substrate and comprising a fiber optic connector; an optoelectronic transducer incorporated within the ROSA; and a preamplifier circuit incorporated within the ROSA. The Examiner has acknowledged that "Yonemura does not disclose a preamplifier circuit operable to linearly amplify an electrical

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Edouard Garcia

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data signal generated by the opto-electronic transducer [and] and adjustable bandwidth post-amplifier circuit mounted on the substrate and coupled to an output of the preamplifier circuit.”

The Examiner has cited Ohhata to make-up for Yonemura's failure to teach or suggest a preamplifier that is operable to linearly amplify an electrical data signal generated by the opto-electronic transducer. The Examiner has asserted that Ohhata discloses “a pre-amplifier circuit in an optical receiver operable to linearly amplify (*see Ohhata, e.g., col./line: 5/47-55*) an electrical data signal generated by the optoelectronic transducer.” The section cited by the Examiner, however, recites that Yonemura's optical receiver includes (emphasis added):

an optical receiving element (photo-electric converter) for converting the optical signal into a current signal, a preamplifier for converting the current signal output by the photoelectric converter into a voltage signal, an amplifier having a limiting function for linearly amplifying the voltage signal when the difference between the voltage signal and a reference voltage is smaller than a predetermined voltage, and for limiting amplifying the voltage when the difference is larger than the predetermined voltage, and an automatic-gain-control amplifier for amplifying the output of the amplifier having the limiting function, to produce a signal having a constant swing.

That is, the amplifier to which the Examiner attributes the linear amplification function is different from the preamplifier that is operable to linearly amplify an electrical data signal generated by the opto-electronic transducer. Indeed, the “amplifier having the limiting function” that is recited in the above-quoted section of Ohhata's disclosure corresponds to the AWL circuit shown in FIG. 9, which clearly shows the AWL circuit located downstream of the preamplifier circuit PRE (see also, col. 8, lines 14-21: “the amplifier AWL of FIG. 9 provides a linear amplification to an input signal that has a small swing... Thus, the amplifier AWL of the present invention acts as a linear amplifier that holds the output swing generally at a constant value by a limiting function only when the output swing exceeds the constant value.”)

Thus, contrary to the Examiner's assertion, Ohhata does not make-up for the failure of Yonemura to teach or suggest a preamplifier that is operable to linearly amplify an electrical data signal generated by the opto-electronic transducer, as recited in claim 1.

The Examiner has cited Williams to make-up for Yonemura's failure to teach or suggest an adjustable bandwidth post-amplifier circuit mounted on the same substrate on

which the ROSA is mounted and coupled to an output of the preamplifier circuit. In particular, the Examiner has asserted that:

Williams disclosed an adjustable bandwidth amplifier (e.g., col./line 7/25-35). It would have been obvious to one of ordinary skill in the art at the time of invention to apply an adjustable bandwidth amplifier after a preamplifier so that the receiver would operate over a range of frequencies consistent with the wide range of frequencies used in the industry.

Contrary to the implication of the Examiner's argument, Williams does not support the Examiner's conclusion that "it would have been obvious to one of ordinary skill in the art at the time of invention to apply an adjustable bandwidth amplifier after a preamplifier." Indeed, Williams' variable bandwidth transimpedance amplifier 20 is the preamplifier of Williams' optical communications receiver. For example, in the Summary section of his disclosure, Williams teaches that the "invention is particularly directed to a modification of the receiver's transimpedance preamplifier input stage" (col. 1, lines 52-54; emphasis added) and, with reference to FIG. 1, Williams explains that the "cathode 14 of photodiode 10 is coupled to a signal input port 21 of a transimpedance amplifier 20" (col. 2, lines 46-47).

There is nothing whatsoever in Williams' disclosure that would have led one of ordinary skill in the art at the time the invention was made to couple Williams' transimpedance amplifier to an output of a preamplifier circuit of a fiber optic receiver, as recited in claim 1. Indeed, Williams explicitly teaches away from such a modification of his invention. In particular, Williams explicitly contrasts his inventive "modification of the receiver's transimpedance preamplifier input stage" (col. 1, lines 53-54) with prior problematic approaches to implementing a broadband receiver with "'post' amplification stage, complex noise filtering circuitry downstream of the input signal" (col. 1, lines 30-31). Thus, contrary to the Examiner's implication, Williams' disclosure explicitly teaches away from the Examiner proposed modification of Williams' invention. Accordingly, one of ordinary skill in the art at the time the invention was made would not have been motivated to move Williams' invention to a post amplification stage of the optical communications receiver, as proposed by the Examiner.

For at least these reasons, the Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a) over Yonemura in view of Ohhata and Williams should be withdrawn.

In his rejection of claim 1, the Examiner has asserted that:

... the fact that the applicant has separated the amplifiers into post and preamplifier has no patentable weight over the prior art. These functions could be integrated or separated without changing the functioning of the circuit.

These assertions reveal the improper standard that the Examiner has applied in his rejections, a standard which is based on impermissible hindsight reconstruction of the claimed invention, using applicants' disclosure as a blueprint for piecing together prior art found by keyword search to defeat patentability.

Rather than adhere to a proper standard for establishing a *prima facie* case of obviousness, the Examiner has merely argued that "the fact that the applicant has separated the amplifiers into post and preamplifier has no patentable weight over the prior art." While it may be easier for the Examiner to simply deem inconvenient claim limitations as not having patentable weight and then reject a hypothetical claim that does not include such inconvenient limitations, such an approach is improper because it invites the Examiner to substitute his unprincipled gut feelings about a claim for a proper, rigorous analysis of the claim language and the prior art. For this reason, the MPEP prohibits the Examiner from rejecting a claim in this way. For example, regarding the "rearrangement of parts" doctrine, the MPEP § 2144.04 IV.C explains that the doctrine cannot be invoked without finding in the cited references the requisite motivation or reason for one skilled in the art to arrive at the arrangement of features recited in the claims (emphasis added):

"The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).

Thus, the Examiner is prohibited from resting his obviousness rejection on the unsubstantiated assertion that "it would have been obvious to one of ordinary skill in the art at the time of invention to apply an adjustable bandwidth amplifier after a preamplifier" based on the assertion that "the fact that the applicant has separated the amplifiers into post and preamplifier has no patentable weight over the prior art."

The examiner additionally is reminded that:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not on applicants' disclosure.

MPEP § 706.02(j) (emphasis added). Furthermore, as pointed out by the Patent Office Board of Appeals and Interferences:

The examiner should be aware that "deeming" does not discharge him from the burden of providing the requisite factual basis and establishing the requisite motivation to support a conclusion of obviousness.

Ex parte Stern, 13 USPQ2d 1379 (BPAI 1989).

The Examiner is therefore obligated to find in the cited references a teaching or suggestion of all the claim limitations recited in claim 1. Yet the Examiner has completely failed to point to any teachings in the cited references that would have led one of ordinary skill in the art to a fiber optic receiver that comprises a substrate, a receiver optical sub-assembly (ROSA), an opto-electronic transducer, a preamplifier circuit, and a post-amplifier circuit, wherein the opto-electronic transducer and the preamplifier circuit are incorporated within the ROSA and both the ROSA and the post-amplifier circuit are mounted on the substrate.

In addition, the Examiner has denigrated claim 1 by improperly characterizing the recited features as merely making parts separable or changing the placement of parts. Claim 1 explicitly recites a particular non-obvious arrangement of (a) a substrate, (b) a ROSA, (c) a fiber optic connector, (d) an opto-electronic transducer, (e) a preamplifier circuit, and (f) an adjustable bandwidth post-amplifier circuit. This non-obvious arrangement of elements achieves specific tangible advantages that are not achievable by prior fiber optic receiver designs. In particular, the inventive placement of the adjustable bandwidth amplifier outside the ROSA enables the analog electrical data signals generated by the opto-electronic transducer to be amplified and shaped properly for data recovery, while allowing the receiver to be housed within a package sized to fit within fiber optic communication devices with